

Gas Hydrate Drilling Problems

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Gulf of Mexico Hydrate R&D
Planning Workshop

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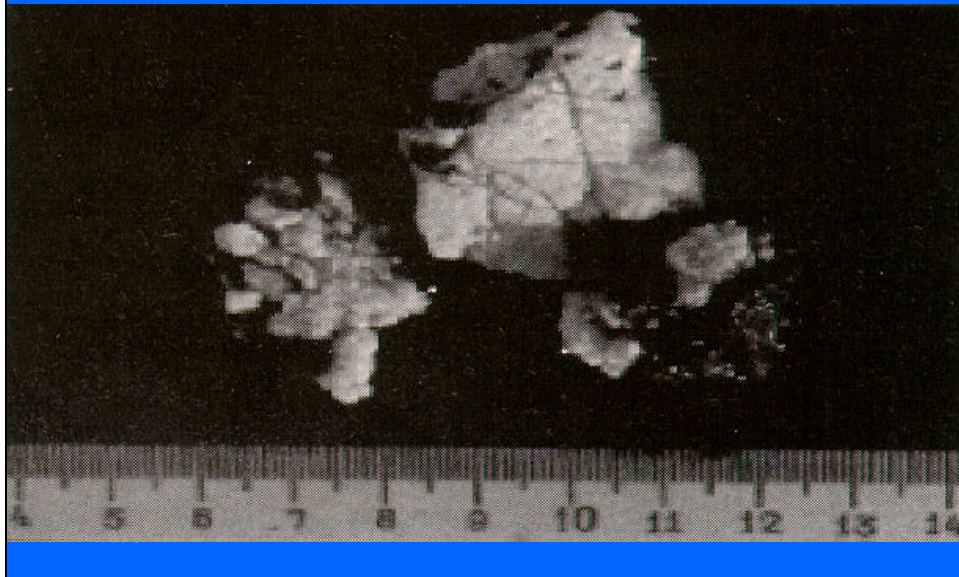
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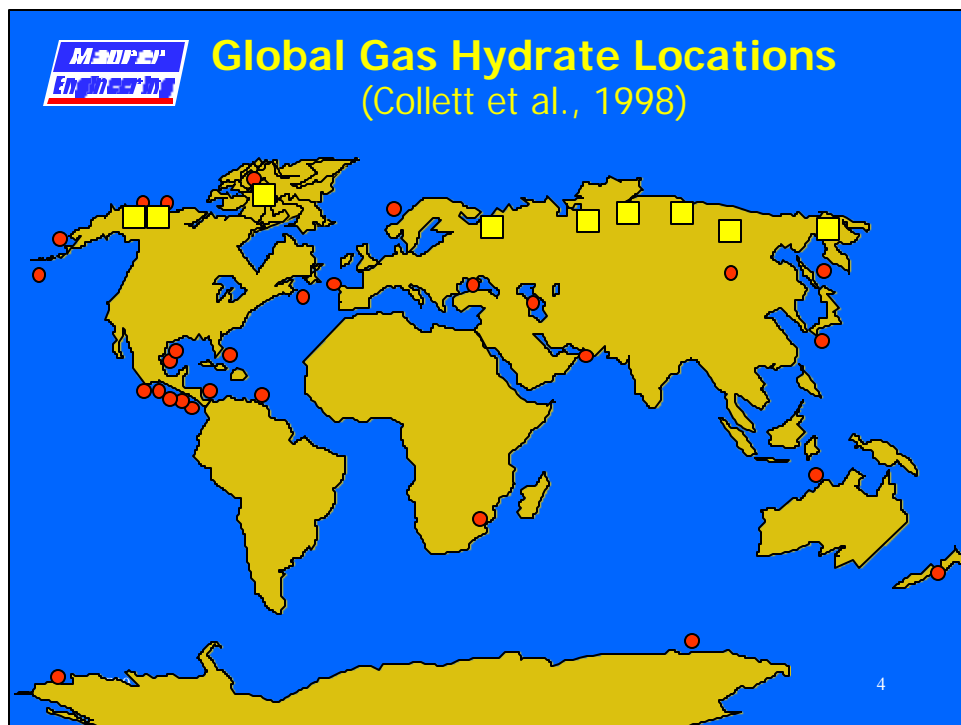
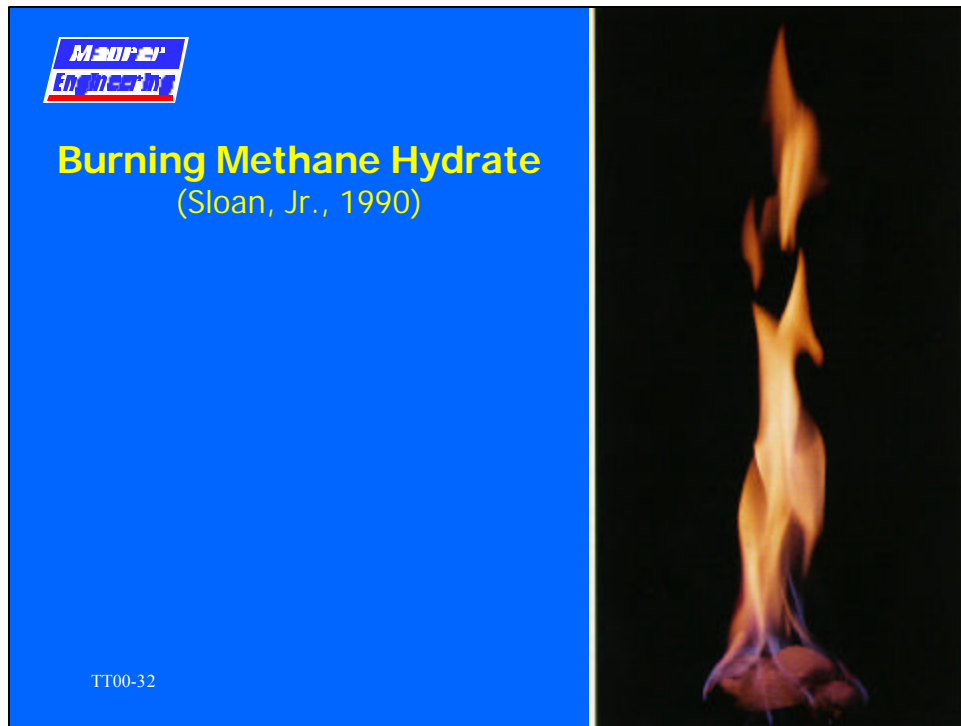
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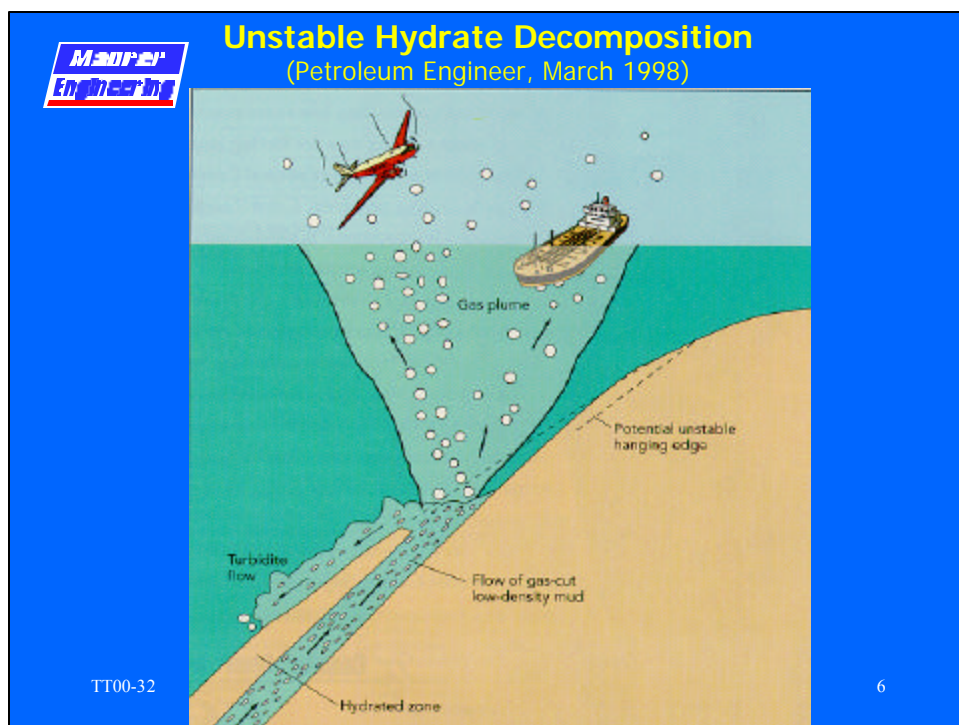
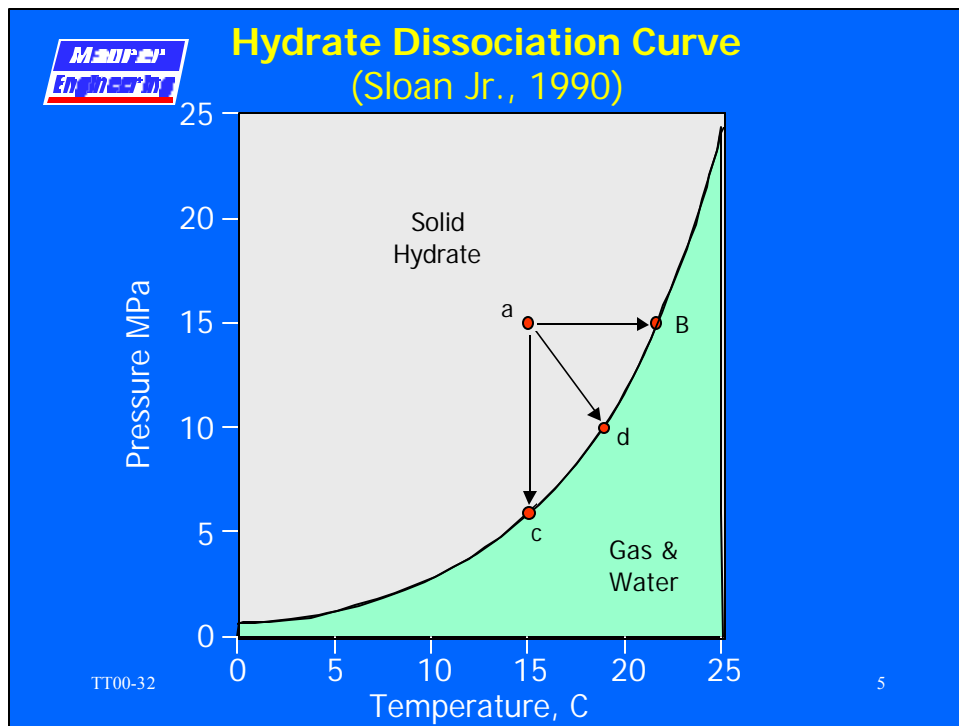


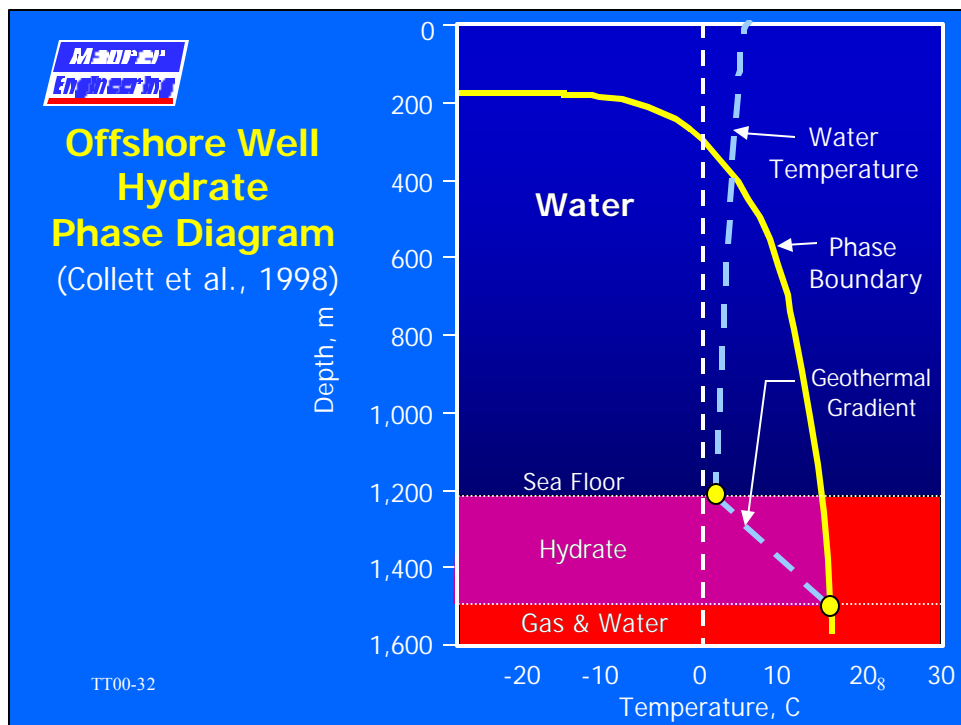
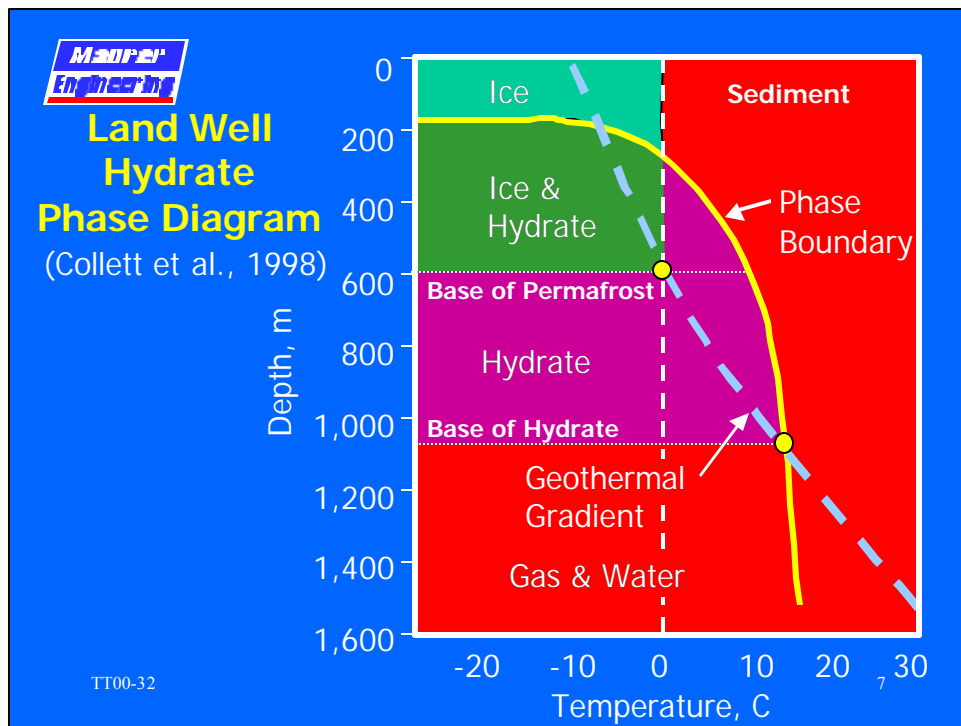
Gas Hydrates

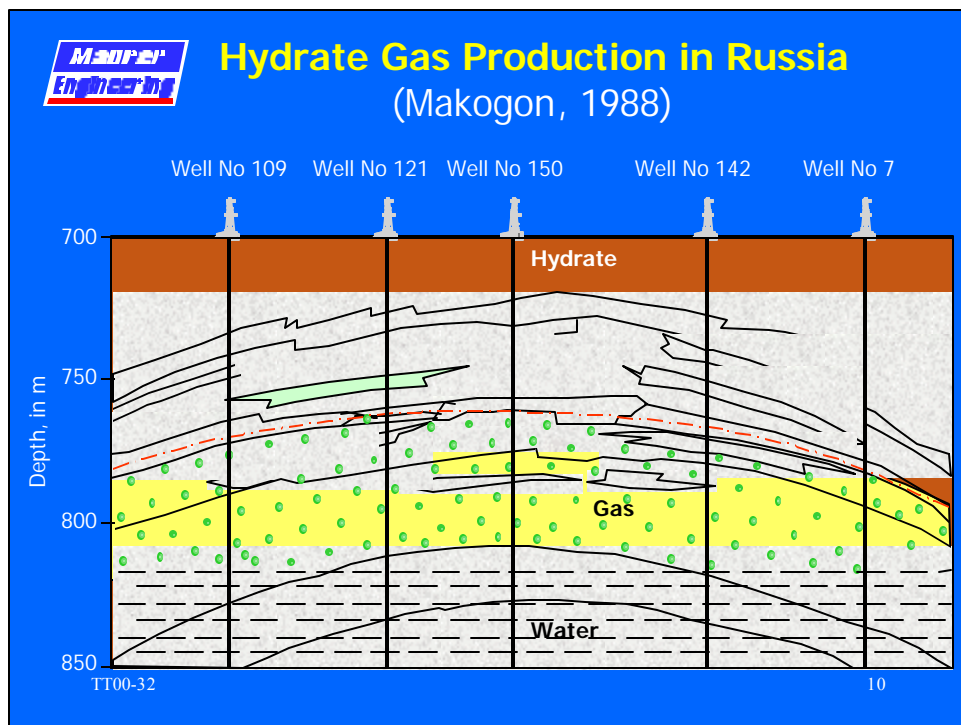
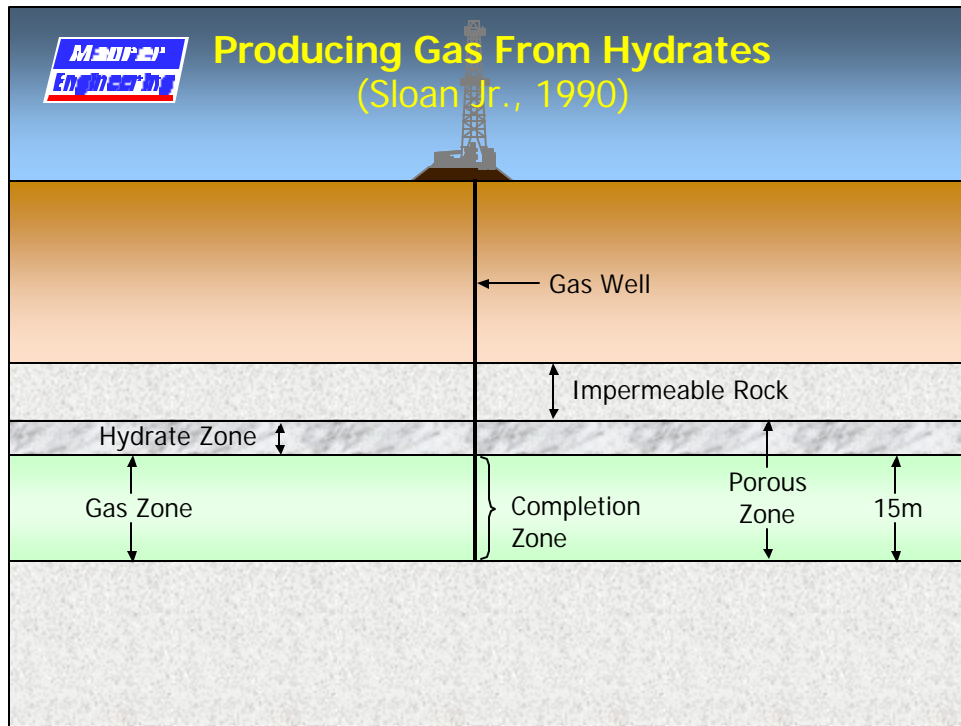
Solid Mixture of Gas and Water
(Petroleum Engineer, March 1998)







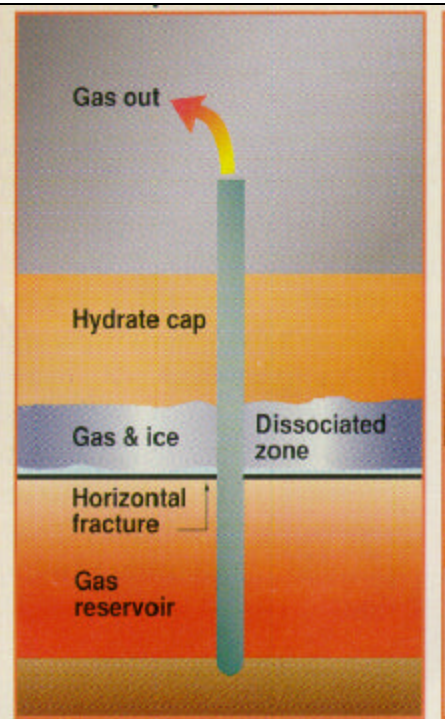






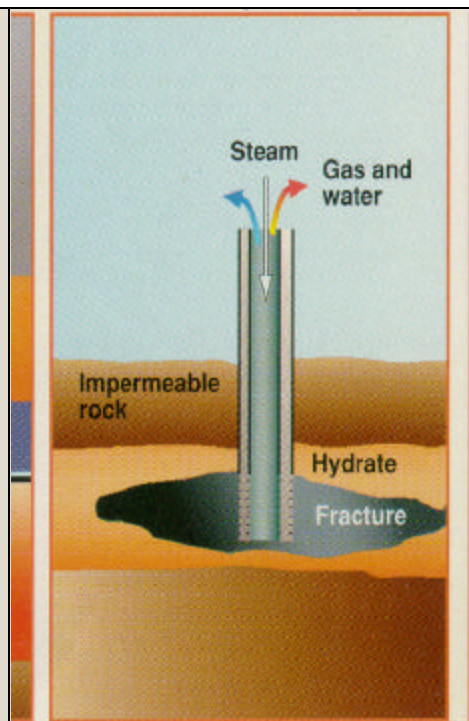
Depressurization Hydrate Production

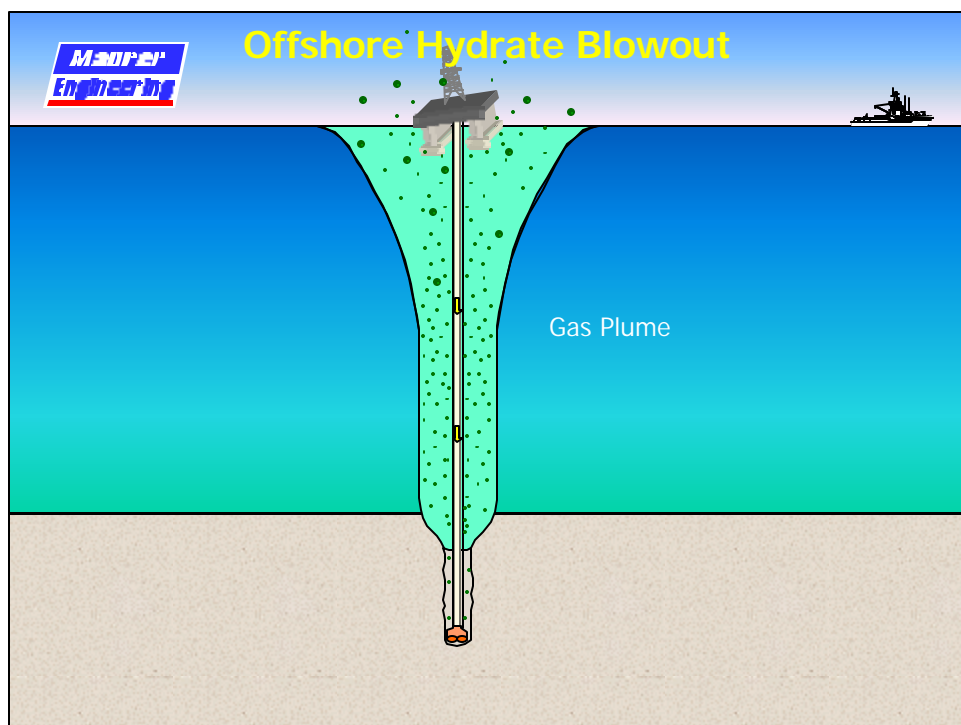
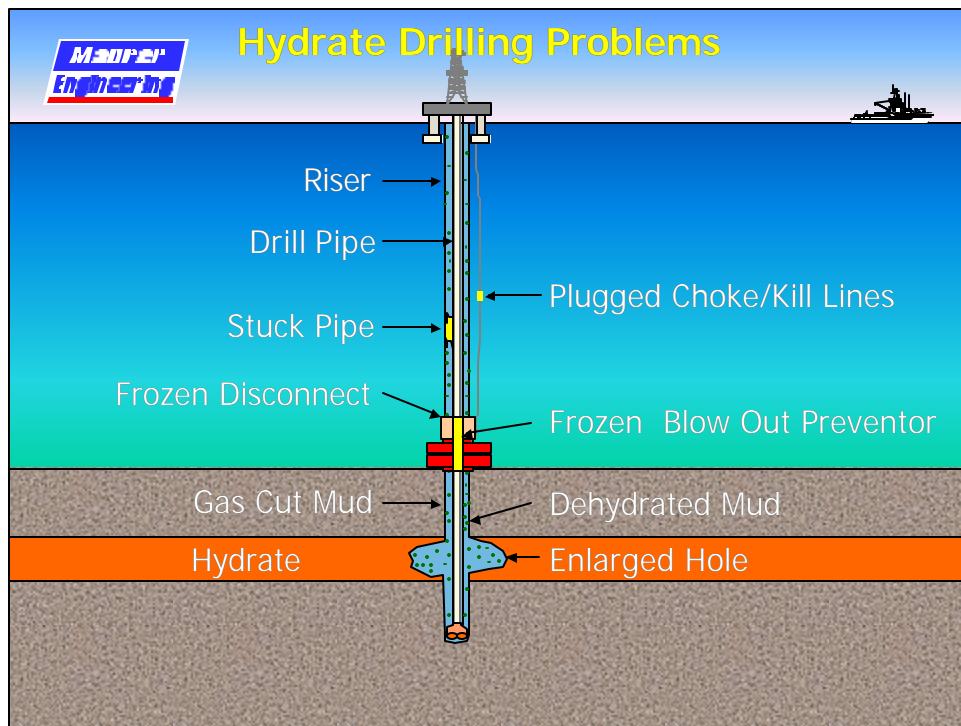
(Collett et al., 1998)



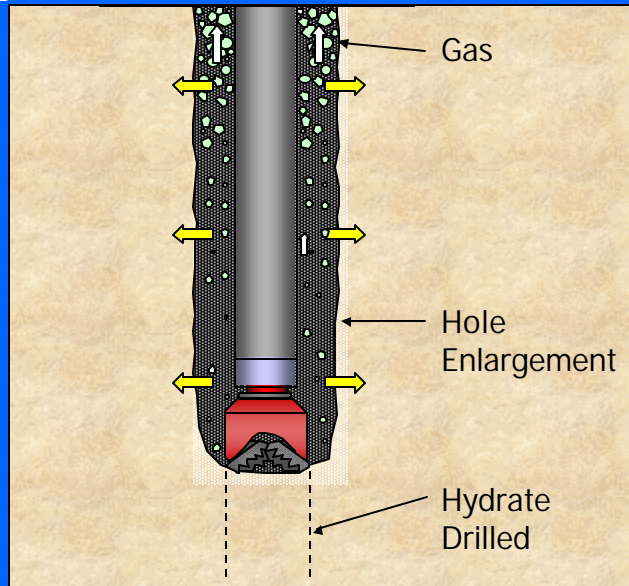
Thermal Injection-Cycle Hydrate Production

(Collett et al., 1998)





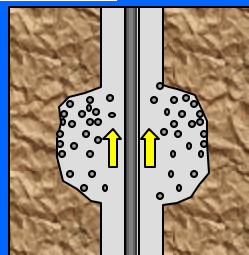
Hydrate Drilling Mechanism



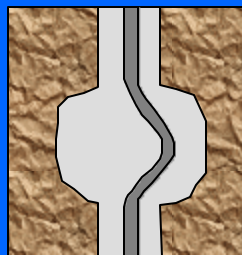
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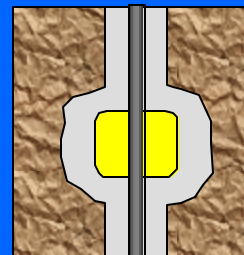
Problems with Enlarged Holes



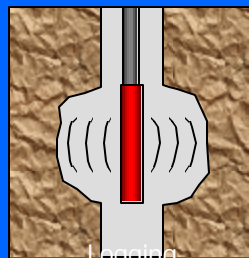
Hole Cleaning



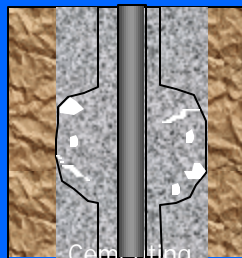
Drill Pipe Buckling



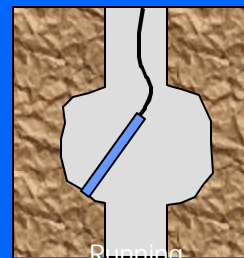
Packers



Logging



Cementing



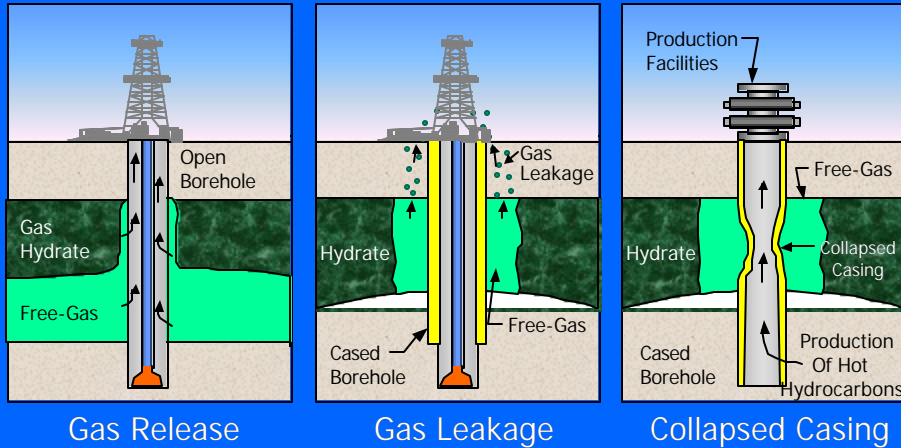
Running Wire Line Tools

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Gas Hydrate Drilling and Production Problems

(Collett, 2000)



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**"Gas hydrate is a significant
hazard to drilling and production
operations"**

(Collett ,2000)

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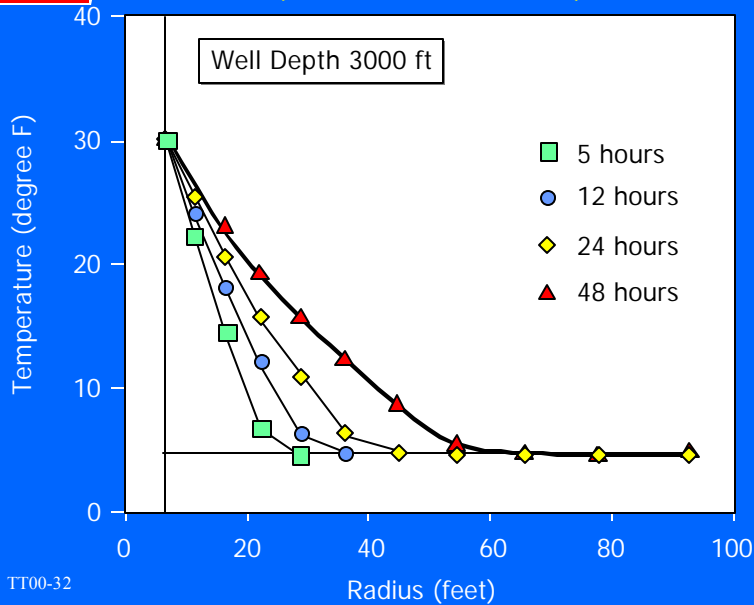
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Temperature Profile in Dissociation Zone

(Roadifer et al., 1987)



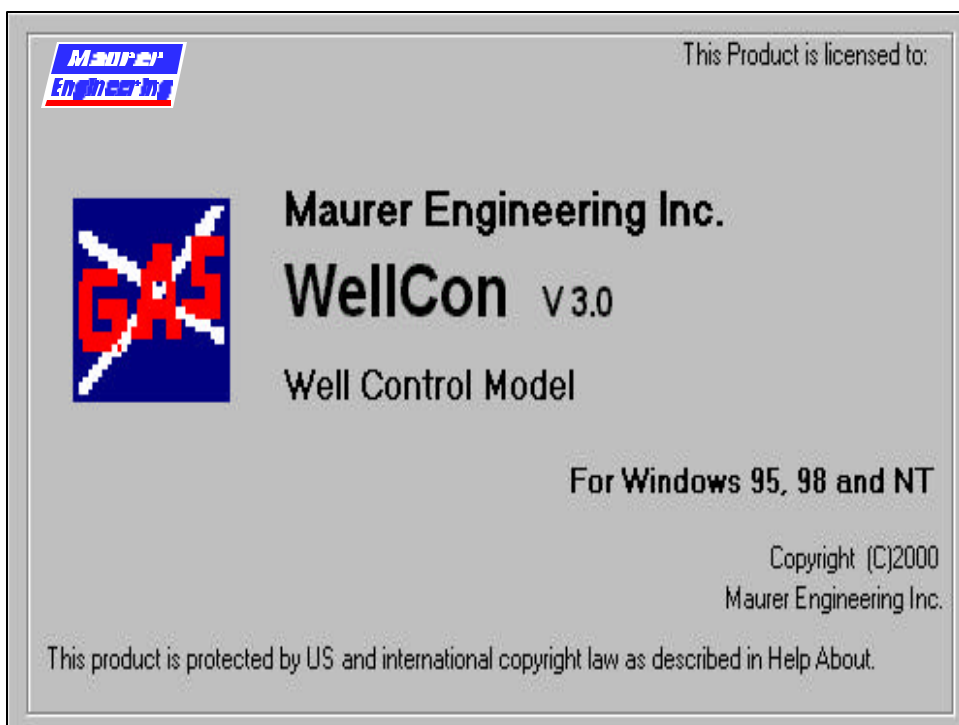
Factors Increasing Gas Flow Rate

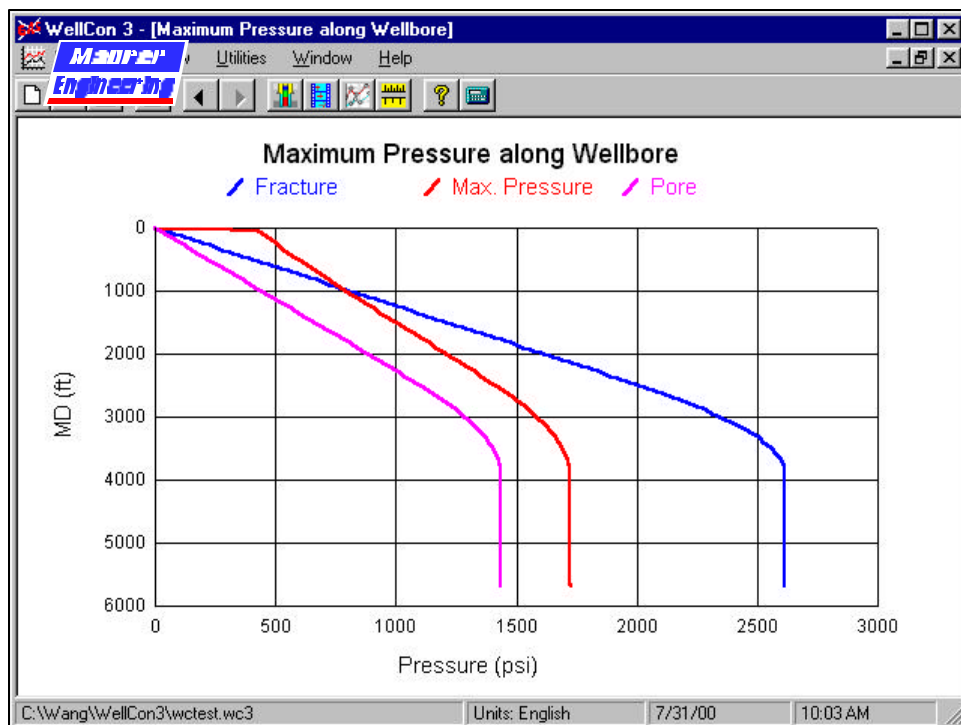
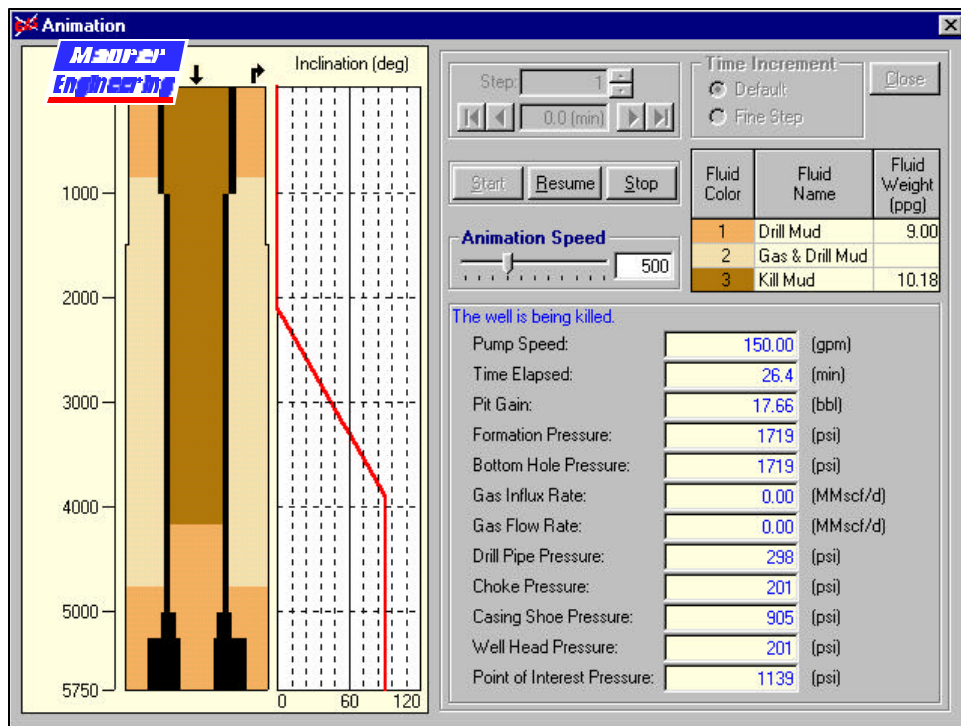
(Roadifer et al., 1987)

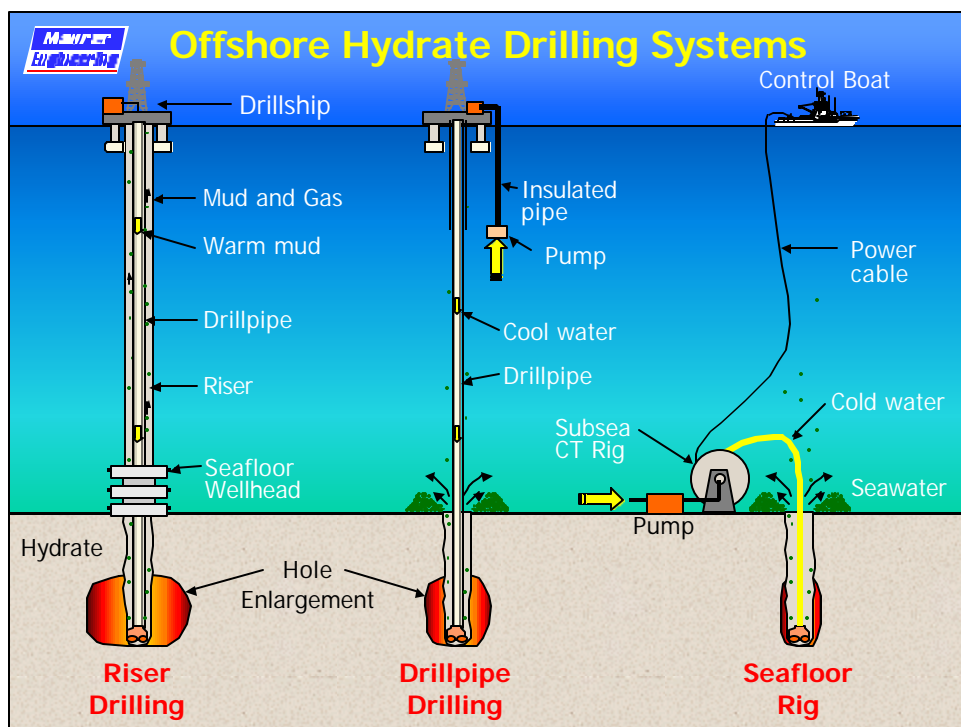
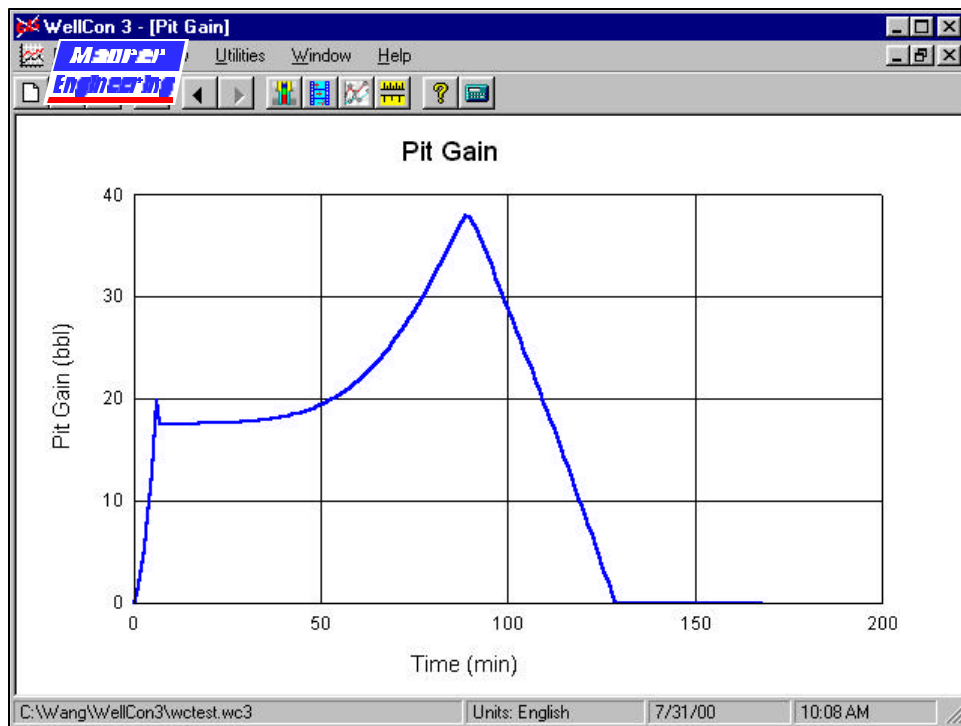
- Increased mud temperature
- Reduced mud weight
- Increased wellbore diameter
- Increased hydrate thickness

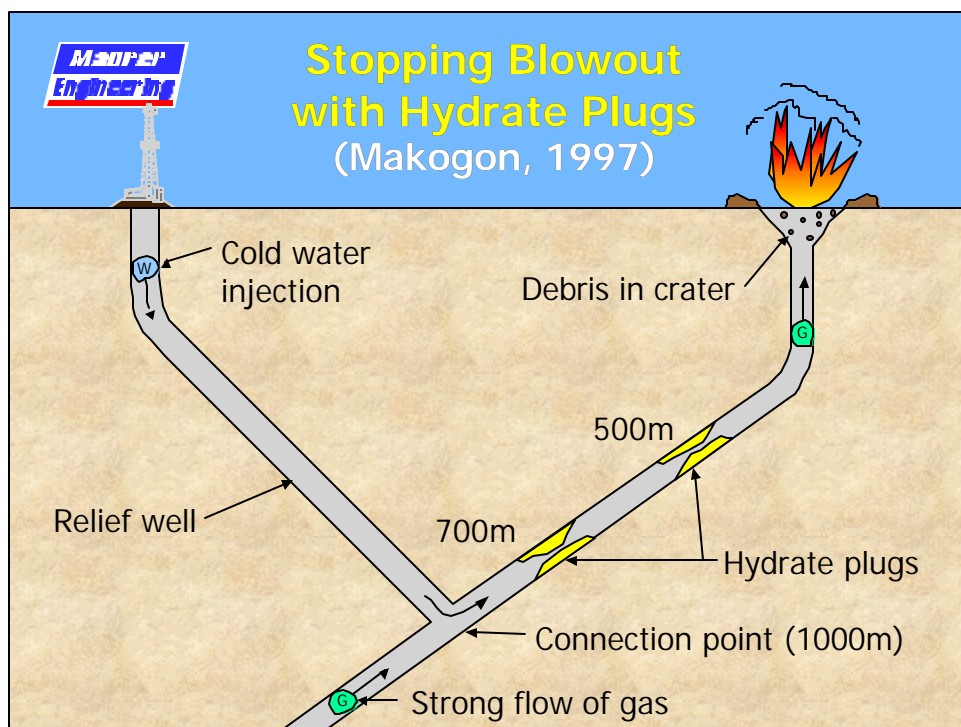
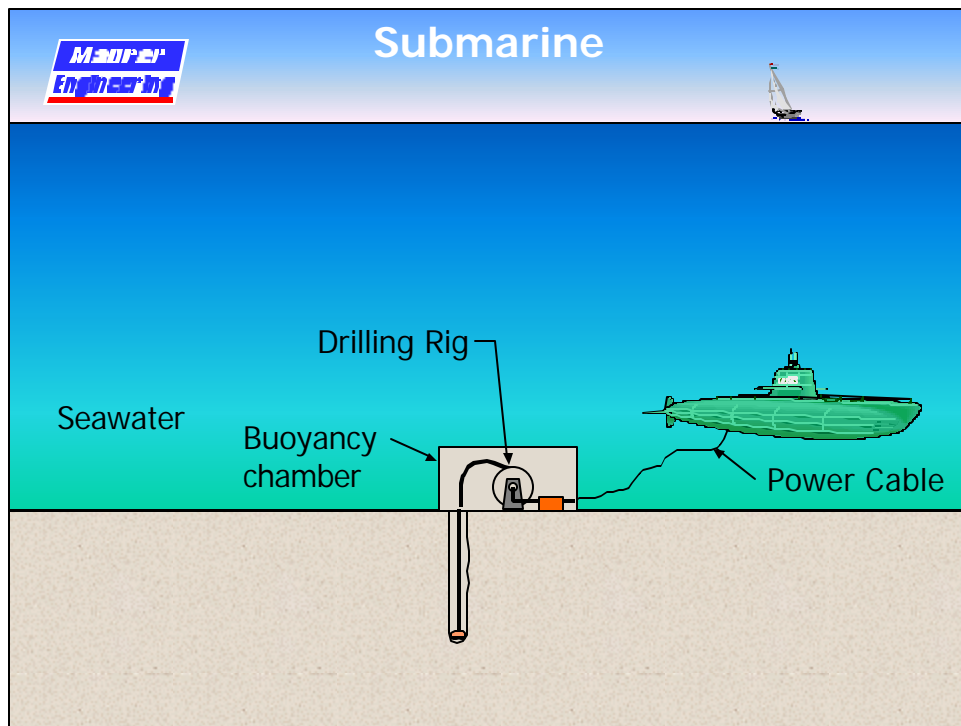
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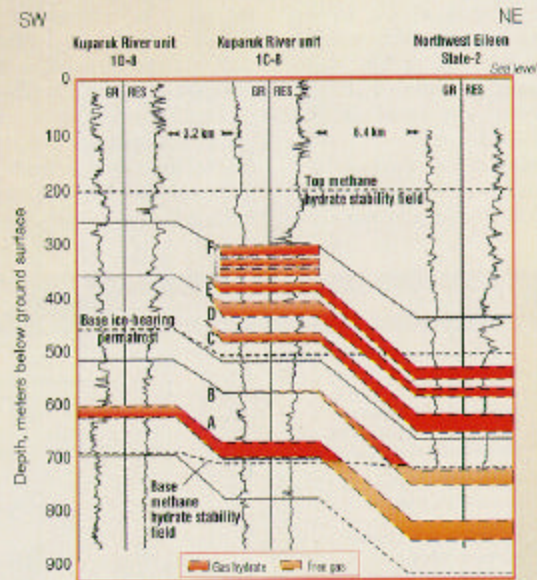






Well Log Geologic Cross Section (Collett et al., 1998)

Prudhoe Bay and Kuparuk River oil fields



Hydrate Drilling Recommendations

- Fund hydrate drilling R&D immediately
- Focus on safety and reducing costs
- Document Russian drilling technology
- Develop improved computer models
- Conduct experiments in oil and gas wells
- Develop inexpensive seafloor coring system

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The End

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